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Utah Department of Natural Resources
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INTERIM GEOLOGIC MAP OF THE DUTCH JOHN 30' x 60' QUADRANGLE, DAGGETT AND UINTAH COUNTIES, UTAH, MOFFAT COUNTY, COLORADO, AND SWEETWATER COUNTY, WYOMING

by

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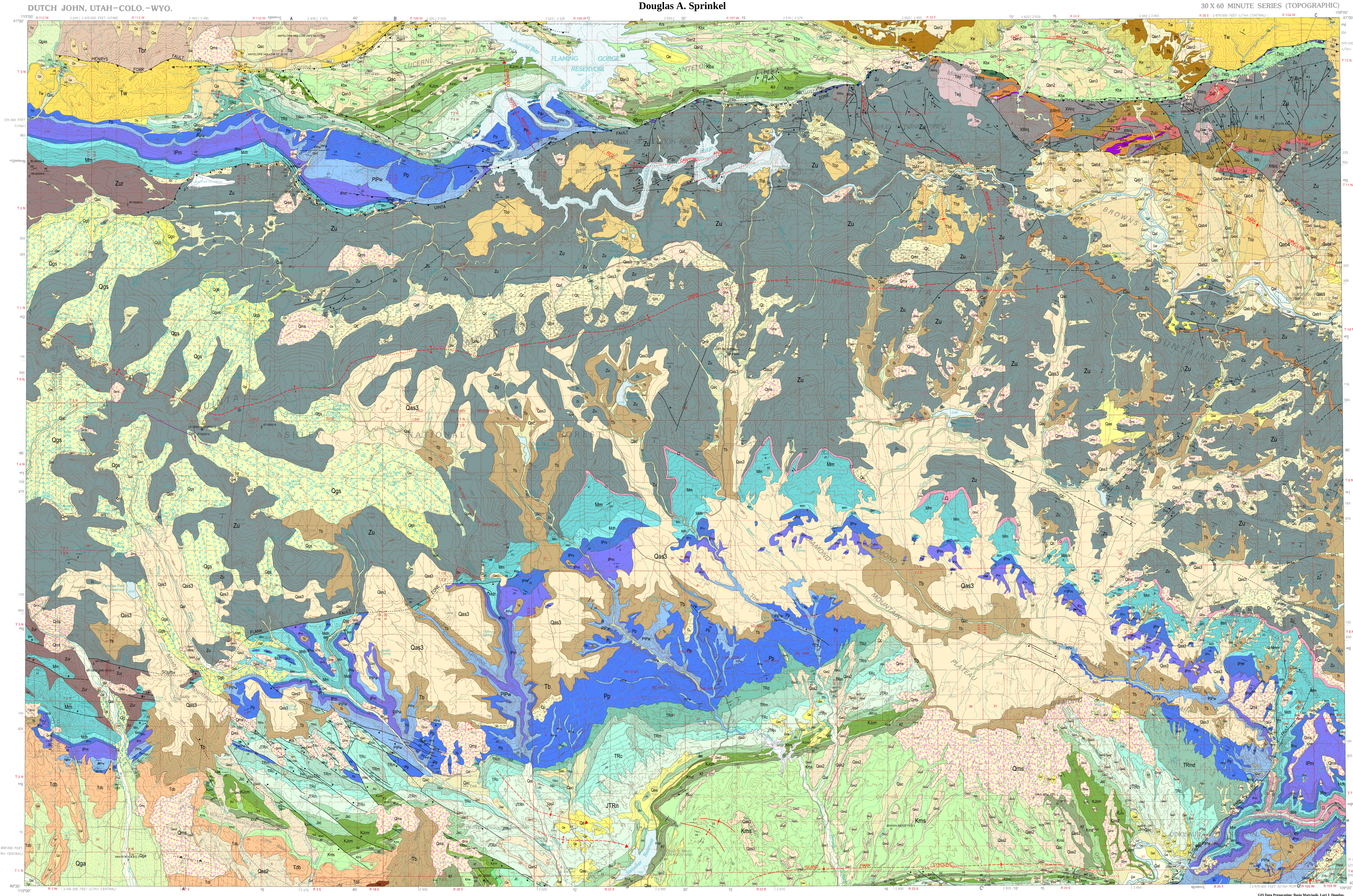
Plate 1 of 3
Utah Geological Survey 2006
Open-File Report 491DM



Base from U.S. Geological Survey, 1981
Projection: UTM Zone 12
Units: Meters
Datum: NAD 1927
Spheroid: Clarke 1866

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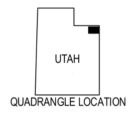
14°
TRUE NORTH
MAGNETIC NORTH
APROXIMATE MEAN DECLINATION, 1981

SCALE 1:100 000
CONTOUR INTERVAL 50 METERS
5 0 5 10 15 Kilometers
5 0 5 Miles



QUADRANGLE LOCATION

GIS Data Preparation: Basia Matyjasik, Lori J. Douglas, Kent D. Brown, and Douglas A. Sprinkel

This map is a plot of Geographic Information System (GIS) files created to visually represent the content of the GIS data files. It is not a published map and it contains many features that do not meet UGS cartographic standards, such as automatically generated labels that may overlap other labels and lines.

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Description of Map Units

Qf FILL - Material (earthen and concrete) used in dams for Steinaker Reservoir and settling pond along Brush Creek as part of phosphate mining operations; not all fill material is mapped.

Qmf DEBRIS-FLOW DEPOSITS (HISTORICAL) - Unconsolidated and poorly sorted heterogeneous mixture of boulders, gravel, sand, silt, and mud; matrix supported; deposited in Sheep Creek Canyon on June 9, 1965 (Sprinkel and others, 2003); less than 2 m thick.

Qal FLOOD-PLAIN ALLUVIUM (HOLOCENE) - Unconsolidated silt, sand, and gravel mostly along Green River; 1-30 m thick.

Qaf YOUNGEST ALLUVIAL-FAN DEPOSITS (HOLOCENE) - Unconsolidated, poorly sorted boulder, gravel, sand, and silt; less than 30 m thick.

Qac MIXED ALLUVIUM AND COLLUVIUM (HOLOCENE AND PLEISTOCENE) - Unconsolidated, poorly to moderately sorted mud, silt, sand, and gravel along channels of Green River tributaries, smaller streams, and intermittent streams; on Mancos Shale, unit is mostly reworked mud; less than 10 m thick.

Qae MIXED ALLUVIUM AND EOLIAN DEPOSITS (HOLOCENE) - Unconsolidated alluvial mud, silt, and sand mixed with well-sorted, fine-grained, windblown sand and silt; less than 10 m thick.

Qe EOLIAN DEPOSITS (HOLOCENE) - Unconsolidated, well-sorted, fine-grained, windblown sand and silt; less than 10 m thick.

Qc COLLUVIUM (HOLOCENE) - Heterogeneous mixture of boulders, gravel, cobbles, sand and silt that may grade into talus, landslide, and alluvial deposits; thin to a few tens of meters thick.

Qmt TALUS DEPOSITS (HOLOCENE AND PLEISTOCENE) - Unconsolidated and unstratified angular rock fragments on and at the base of steep slopes and cliffs; many larger deposits include protalus ramparts and are likely Pleistocene in age; smaller deposits in which colluvium locally is significant are likely Holocene in age; less than 5 m thick.

Qgr ROCK GLACIER DEPOSITS (HOLOCENE AND PLEISTOCENE[?]) - Unconsolidated and unstratified angular rock fragments at the base of headwall cirques and have "rumpled-carpet" look on aerial photographs; grade into talus deposits; less than 5 m thick.

Qms SLIDES, SLUMPS, AND FLOWS (HOLOCENE AND PLEISTOCENE) - Earthflows slumps, and slides; some Qms units share a common boundary with adjoining mass movement.

Qat ALLUVIAL-TERRACE DEPOSITS, UNDIVIDED (HOLOCENE AND PLEISTOCENE[?]) - Unconsolidated to locally cemented silt, sand, gravel, cobbles, and boulders; located along Green River in southeast part of map near Island Park; includes units mapped by Rowley and others (1981) as dissected fan deposits; deposits include several levels 10 to 60 m above Green River and less than a few tens of meters thick.

Qa PIEDMONT ALLUVIUM, UNDIVIDED (HOLOCENE AND PLEISTOCENE[?]) - Unconsolidated to poorly consolidated, poorly to moderately sorted sand, gravel, cobbles, and boulders; poorly developed soil profile with some pedogenic carbonate (caliche) coatings on undersides of clasts; mapped on north and east flank of Phil Pico Mountain and east of Little Mountain along south boundary of map; correlation with other piedmont alluvium units uncertain; less than 3 m thick.

Qan1 YOUNGEST NORTH FLANK PIEDMONT ALLUVIUM (HOLOCENE AND UPPER PLEISTOCENE) - Unconsolidated to poorly consolidated, poorly sorted sand, gravel, cobbles and boulders; poorly developed soil profile and stage I pedogenic carbonate (caliche) coatings on undersides of clasts; mapped on north flank of Uinta Mountains and topographically lowest of four North Flank piedmont alluvium units; less than 10 m thick.

Qan2 YOUNGER NORTH FLANK PIEDMONT ALLUVIUM (UPPER PLEISTOCENE) - Unconsolidated to poorly consolidated, poorly sorted sand, gravel, cobbles and boulders; poorly to well-developed soil profile and stage I-II pedogenic carbonate (caliche) coatings on undersides of clasts in upper 1-2 m of deposits; mapped on north flank of Uinta Mountains and topographically above Qan1; less than 10 m thick.

Qan3 OLDER NORTH FLANK PIEDMONT ALLUVIUM (MIDDLE PLEISTOCENE) - Unconsolidated to moderately consolidated, poorly sorted sand, gravel, cobbles and boulders; poorly to well-developed soil profile and stage I-II pedogenic carbonate (caliche) coatings on undersides of clasts; mapped on north flank of Uinta Mountains and topographically above Qan2; less than 10 m thick.

Qan4 OLDEST NORTH FLANK PIEDMONT ALLUVIUM (MIDDLE PLEISTOCENE) - Unconsolidated to moderately consolidated, poorly sorted sand, gravel, cobbles and boulders; poorly to well-developed soil profile and stage I-III pedogenic carbonate (caliche) coatings on undersides of clasts; mapped on north flank of Uinta Mountains and topographically the highest of four North Flank piedmont alluvium units; less than 10 m thick.

Qas1 YOUNGEST SOUTH FLANK PIEDMONT ALLUVIUM (HOLOCENE AND UPPER PLEISTOCENE) - Unconsolidated to poorly consolidated, poorly sorted sand, gravel, cobbles and boulders; poorly developed soil profile and stage I pedogenic carbonate (caliche) coatings on undersides of clasts; mapped on south flank of Uinta Mountains along lower Brush Creek and in Island Park; topographically lowest of three South Flank piedmont alluvium units; less than 2 m thick.

Qas2 YOUNGER SOUTH FLANK PIEDMONT ALLUVIUM (UPPER PLEISTOCENE) - Unconsolidated to moderately consolidated, poorly sorted sand, gravel, cobbles and boulders; poorly to well-developed soil profile and stage II-III pedogenic carbonate (caliche) coatings of clasts in upper 1 m of deposit; mapped on south flank of Uinta Mountains from Island Park to Whiterocks Canyon and topographically higher than Qas1; less than 3 m thick.

Qas3 OLDER SOUTH FLANK PIEDMONT ALLUVIUM (MIDDLE PLEISTOCENE) - Unconsolidated to poorly consolidated, poorly sorted, silt, sand, gravel, and cobble to boulder deposit; subangular to subrounded clasts dominated by quartz sandstone and quartzite of Uinta Mountain Group; mostly matrix supported with clast-supported channel deposits; well-developed soil profile with stage III-IV carbonate (caliche) cementation; some clasts coated with iron-manganese deposits; boulders are scattered on surface as lag deposit; best exposed at Matt Warner Reservoir, along south margin of Diamond Plateau, and in Dry Fork landslide along Dry Fork drainage where it underlies Smiths Fork Till; deposit typically "rests" on Bishop Conglomerate but does "rest" on pre-Bishop units in places; unit is likely cut by a fault, which forms a 10-km-long fault scarp along Pot Creek; 0-300 m thick.

Qat1 YOUNGEST ALLUVIAL-TERRACE DEPOSITS (HOLOCENE) - Unconsolidated, well-sorted, silt, fine-grained sand, clast-supported gravel, and imbricated, well-rounded pebbles and cobbles; mapped in Browns Park and Little Hole; deposit less than 1 m above Qal; generally corresponds to Qag0 and Qag1 of Counts (2005); may be part of Green River flood plain; less than 3 m thick.

Qab1 YOUNGEST BROWNS PARK PIEDMONT ALLUVIUM (HOLOCENE) - Unconsolidated, moderately sorted, matrix supported silt, fine-grained sand, gravel, and subangular to subrounded pebbles; topographically lowest of four piedmont alluvium units mapped in Browns Park and Little Hole; generally corresponds to Qagp1 of Counts (2005); less than 6 m thick.

Qat2 YOUNGER ALLUVIAL-TERRACE DEPOSITS (HOLOCENE AND UPPER PLEISTOCENE[?]) - Unconsolidated to poorly consolidated, well-sorted, silt, medium- to fine-grained sand, clast-supported gravel, and well-rounded pebbles and cobbles; mapped in Browns Park and Little Hole; deposit less than 20 m above Qal; generally corresponds to Qag2 of Counts (2005); less than 3 m thick.

Qab2 YOUNG BROWNS PARK PIEDMONT ALLUVIUM (HOLOCENE AND UPPER PLEISTOCENE[?]) - Unconsolidated to poorly consolidated, poorly sorted, matrix supported silt, sand, gravel, and cobbles; mapped in Browns Park and Little Hole and topographically above Qab1; generally corresponds to Qagp2 of Counts (2005); less than 6 m thick.

Qat3 OLD ALLUVIAL-TERRACE DEPOSITS (UPPER PLEISTOCENE) - Unconsolidated to poorly consolidated, well-sorted, sand, clast-supported gravel, and imbricated, well-rounded pebbles and cobbles; poorly to moderately developed soil profile and stage I-II carbonate (caliche) coatings on undersides of clasts; mapped in Browns Park and Little Hole; deposit about 25-30 m above Qal; generally corresponds to Qag3 of Counts (2005); less than 3-5 m thick.

Qab3 OLDER BROWNS PARK PIEDMONT ALLUVIUM (UPPER PLEISTOCENE) - Unconsolidated to poorly consolidated, poorly sorted, reddish-brown matrix supported gravel with subangular to subrounded pebbles and cobbles; mapped in Browns Park and Little Hole and topographically above Qab2 deposit; generally corresponds to Qagp3 of Counts (2005); greater than 6 m thick.

Qat4 OLDER ALLUVIAL-TERRACE DEPOSIT (MIDDLE[?] PLEISTOCENE) - Distinct upper and lower units; upper unit is moderately sorted, clast-supported, sandy gravel with well-rounded pebbles and cobbles; lower units are poorly sorted, matrix-supported, tabular-bedded, subangular to well rounded boulder gravel; lower unit is mapped only in Browns Park and interpreted by Counts (2005) as a catastrophic flood deposit; deposit is 30-50 m above Qal; generally corresponds to Qag4 of Counts (2005); upper unit is 6-8 m thick and lower unit is 5 m thick.

Qab4 OLDEST BROWNS PARK PIEDMONT ALLUVIUM (MIDDLE PLEISTOCENE) - Unconsolidated to poorly consolidated, poorly sorted, brown matrix supported gravel with subangular to subrounded pebbles, cobbles, and scattered boulders; mapped in Browns Park and Little Hole and topographically above Qab3 deposit; generally corresponds to Qagp4-7 of Counts (2005); greater than 6 m thick.

Qat5 OLDEST ALLUVIAL-TERRACE DEPOSIT (LOWER[?] PLEISTOCENE) - Unconsolidated to poorly consolidated, well-sorted, sand, clast-supported gravel, and imbricated, well-rounded pebbles and cobbles; well-developed soil profile with stage II carbonate (caliche) coatings of clasts; mapped in Browns Park; deposit more than 80 m above Qal; generally corresponds to Qag5-8 of Counts (2005); 5-10 m thick.

Qgp PATTERNED GROUND (HOLOCENE AND PLEISTOCENE) - Soil structures developed on bedrock unit Zu; composed generally of fine-grained materials surrounded by unconsolidated boulders that are roughly arranged into polygon shapes less than 10 m in diameter; boulders are angular sandstone fragments of the unnamed formation of the Uinta Mountain Group; mapped on the saddle west of Leidy Peak; estimated less than 1 m thick.

Qg GLACIAL TILL, UNDIVIDED (PLEISTOCENE) - Unconsolidated, poorly sorted, angular to rounded boulders, cobbles, and pebbles of mostly red sandstone and quartzite (Uinta Mountain Group); generally forms low ridges and knolls along sides of lower Whiterocks Canyon, south flank Uinta Mountains; age of glaciation not known; 1-50 m thick.

Qga GLACIAL OUTWASH, UNDIVIDED (PLEISTOCENE) - Unconsolidated, well-rounded, mostly red sandstone and quartzite (Uinta Mountain Group) boulders to pebbles and sand deposited by meltwaters of glaciers of undetermined age; less than 5 m thick.

Qgs SMITHS FORK TILL (UPPER PLEISTOCENE) - Unconsolidated, poorly sorted, angular to rounded boulders, cobbles, and pebbles mostly of red sandstone and quartzite (Uinta Mountain Group); generally forms steep ridges, knolls, and kettles with a smooth to hummocky surface with thin soils; Smiths Fork Till correlated to Pinedale glaciation by Douglass (2000) and Munroe (2001); 1-50 m thick.

Qgas SMITHS FORK OUTWASH (UPPER PLEISTOCENE) - Unconsolidated, well-rounded, mostly red sandstone and quartzite (Uinta Mountain Group) boulders to pebbles and sand deposited by meltwaters of Smiths Fork-age glaciers (Munroe, 2001); less than 5 m thick.

Qgb BLACKS FORK TILL (MIDDLE PLEISTOCENE) - Unconsolidated, poorly sorted, angular to rounded boulders, cobbles, and pebbles of mostly red sandstone and quartzite (Uinta Mountain Group); generally forms low ridges, knolls, and kettles with a smooth to subdued hummocky surface with well developed soils; Blacks Fork Till correlated to Bull Lake glaciation by Douglass (2000) and Munroe, (2001); less than 50 m thick.

Qgab BLACKS FORK OUTWASH (MIDDLE PLEISTOCENE) - Unconsolidated, well-rounded, mostly red sandstone and quartzite (Uinta Mountain Group) boulders to pebbles and sand deposited by meltwaters of Blacks Fork-age glaciers (Munroe, 2001); less than 5 m thick.

Qgo PRE-BLACKS FORK TILL (MIDDLE PLEISTOCENE) - Unconsolidated, poorly sorted, angular to rounded cobbles and pebbles of mostly red sandstone and quartzite (Uinta Mountain Group); generally forms a subdued hummocky surface with very well developed soils; pre-Blacks Fork Till correlated to pre-Bull Lake glaciation by Douglass (2000) and Munroe (2001); less than 50 m thick.

Tag TERTIARY GRAVEL DEPOSITS (PLIOCENE TO MIOCENE[?]) - Unconsolidated to moderately consolidated, poorly sorted boulders, cobbles, pebbles, gravel, and sand that caps high-level erosion surface in Goslin Mountain quadrangle; clasts consist of chert, limestone, and quartzite; may be age correlative with Browns Park Formation; maximum thickness less than 50 m.

Tbp BROWNS PARK FORMATION (MIOCENE) - Light-gray and light-brown, poorly to moderately consolidated, cross-bedded sandstone, some tuffaceous sandstone, and subordinate conglomerate, siltstone, and crystal-poor, glassy, rhyolitic air-fall tuff; in Colorado has corrected K-Ar ages of about 8 to 25 Ma (Luft, 1985), but Barstovian fossils, also in Colorado, indicate the formation is likely less than 17 Ma (Honey and Izett, 1988); 0-500 m thick.

Tb BISHOP CONGLOMERATE (OLIGOCENE) - Light-gray to pinkish-gray, friable sandstone and poorly sorted, loosely cemented, boulder to pebble conglomerate mapped on the south flank of the Uinta Mountains; conglomerate beds mapped on Little Mountain consist mostly of Paleozoic and Mesozoic clasts in lower part of formation and become almost exclusively composed of red sandstone and quartzite (Uinta Mountain Group) clasts in upper part; contains light-gray biotite air-fall tuff interbeds; biotite and hornblende from tuff bed K-Ar dated at about 29 Ma (Hansen, 1986); K-feldspar from samples near top of Bishop $^{40}Ar/^{39}Ar$ dated at 30.54 Ma and from lower in the section $^{40}Ar/^{39}Ar$ dated at 34.03 Ma (Kowallis and others, 2005); 0-150 m thick.

Td DUCHESNE RIVER FORMATION (OLIGOCENE AND EOCENE) - Shown on cross section only; see below for description and thicknesses.

Tds STARR FLAT MEMBER, DUCHESNE RIVER FORMATION (OLIGOCENE) - Reddish-brown, reddish-purple, yellowish-gray, and greenish-gray, fine- to coarse-grained sandstone, siltstone, mudstone, and conglomerate; sandstone and fine-grained beds dominate the member and coarsen upward; resistant and thick-bedded; Anderson and Picard (1972) defined this uppermost member of Duchesne River Formation, but preliminary mapping north of Lapoint, Utah, suggests Starr Flat Member could be in lower part of overlying Bishop Conglomerate; Bryant and others (1989) reported fission-track ages of 30 to 34 Ma from west of the quadrangle; 40-230 m thick.

Tdl LAPOINT MEMBER, DUCHESNE RIVER FORMATION (OLIGOCENE AND EOCENE) - Light-reddish-brown and yellowish-gray, fine-grained sandstone, siltstone, and mudstone; contains abundant light-greenish-gray bentonite beds; mostly nonresistant and thin- to very thin bedded; late Eocene (Duchesnean) age based on vertebrate fossil assemblage (Anderson and Picard, 1972); K-Ar ages of 39.3 Ma (Anderson and Picard, 1972), 40.3 Ma (McDowell and others,1973), and 35.7 to 40.3 Ma (Bryant and others, 1989), all from near the base of member; 65-320 m thick.

Tdd DRY GULCH CREEK MEMBER, DUCHESNE RIVER FORMATION (EOCENE) - Medium-reddish-brown and purplish-gray, fine-grained sandstone, siltstone, mudstone, and conglomerate; dominated by slope-forming siltstone and mudstone with ledge-forming thin-bedded sandstone; contains some vertebrate fossils; see Anderson and Picard (1972) for summary of fossils; less than 150-200 m thick.

Tdb BRENNAN BASIN MEMBER, DUCHESNE RIVER FORMATION (EOCENE) - Light- to medium-red, light-reddish-brown, and yellowish-gray, fine- to medium-grained lithic sandstone and siltstone with minor amounts of mudstone and conglomerate; contains well-developed paleosols; basal part of this member, as much as 60 m, intertongues with the underlying Uinta Formation in most of the quadrangle; this contact is at the base of a resistant reddish-brown sandstone bed that lies on the uppermost variegated mudstone of Uinta Formation; Brennan Basin Member also lies unconformably on Green River Formation near Squaw Ridge and Mesaverde Group along Asphalt Ridge; contains a diverse assemblage of vertebrate fossils of late Eocene age (see Anderson and Picard, 1972 for a summary); 220-600 m thick.

Tbr BRIDGER FORMATION (EOCENE) - Soft, light-green-gray, light-brown, light-gray, and pale-yellow shale, sandstone, and limestone exposed north of Uinta Mountains; includes resistant, light-gray, light brown, and yellow-gray cobble and boulder conglomerate that forms much of Phil Pico Mountain; conglomerate clasts are subangular to subrounded, poorly sorted, and composed of conglomeratic sandstone (Gartra Member of Chinle Formation), fine-grained sandstone (Weber and Nugget Sandstones, and cherty limestone (Madison and Round Valley Limestones); 600 m thick.

Tu UINTA FORMATION (EOCENE) - Light-gray, light-greenish-gray, light-brown, and light-purple, mudstone and claystone with interbeds of greenish-gray, yellow, and brown fine-grained sandstone; contains minor conglomerate and tuffaceous beds; forms nonresistant slopes and thin resistant ledges; 0-625 m thick; in cross section only on south flank of the Uinta Mountains.

Tg GREEN RIVER FORMATION (EOCENE) - Soft to moderately resistant, light- to medium-gray, light- to medium-brown, yellow, and greenish-gray mudstone, organic-rich marlstone, siltstone, sandstone, and cherty limestone; on north flank of Uinta Mountains unit is in Laney Shale Member; lower part intertongues with underlying Wasatch Formation and the upper part intertongues with the overlying Bridger Formation north of Uinta Mountains; 400-1173 m thick in the quadrangle, but thicker in basins to north and south.

Tw WASATCH FORMATION (EOCENE AND PALEOCENE[?]) - Red, yellow, and gray friable sandstone, siltstone, claystone, and conglomerate; upper part intertongues with overlying Green River Formation in Green River Basin north of quadrangle; conglomerate clasts consist of mostly gray limestone (Paleozoic), sandstone (Mesozoic), and some red sandstone and quartzite (Uinta Mountain Group); shown only in cross section on south flank; 600-1500 m thick.

Tfu FORT UNION FORMATION (PALEOCENE) - Light-gray, light-brown, light-green, and brown sandstone, shale, and claystone with some carbonaceous shale, coal, siltstone, and conglomerate beds; inverse stratigraphy of Mesozoic through Paleozoic clasts in conglomerate beds with some clasts of Uinta Mountain Group locally present; only mapped on north flank of Uinta Mountains; 500-900 m thick; tectonically thickened locally.

TKfz UINTA FAULT ZONE ROCKS (TERTIARY AND UPPER CRETACEOUS) - Broken rock derived mostly from the hanging wall that ranges from recognizable rock fragments to cataclasite and gouge; fault zone varies from a few meters to about one kilometer in width.

Kmv MESAVERDE GROUP (UPPER CRETACEOUS) - Shown on cross section only; includes Ericson Sandstone, Rock Springs Formation, and Blair Sandstone on north flank; see below for descriptions and thicknesses; undivided and 280-800 m thick on south flank.

Ke ERICSON SANDSTONE (UPPER CRETACEOUS) - Resistant, light-gray, medium- to coarse-grained sandstone and lenses of conglomerate, with local thin beds of dark-gray nonmarine shale; only mapped on north flank of Uinta Mountains; 88-275 m thick.

Krs ROCK SPRINGS FORMATION (UPPER CRETACEOUS) - Resistant, light-gray to pale-grayish-orange, fine-grained, cross-bedded sandstone with some carbonaceous shale and coal beds; only mapped on north flank of Uinta Mountains; 0-385 m thick; thins to east.

Kbl BLAIR SANDSTONE (UPPER CRETACEOUS) - Resistant, light-gray, pale-grayish-orange to pink, thick-bedded sandstone with interbedded gray marine shale; pinches out eastward becoming a tongue in Baxter Shale near the Glades; only mapped on north flank of Uinta Mountains; 0-110 m thick.

Kbx BAXTER SHALE (UPPER CRETACEOUS) - Gray, soft, slope-forming calcareous shale containing numerous beds of fine-grained, ripple-marked sandstone and minor limestone; equivalent to Mancos Shale; only mapped on north flank of Uinta Mountains; 1890-2100 m thick.

Kms MANCOS SHALE (UPPER CRETACEOUS) - Main body of the Mancos Shale; dark-gray, soft, slope-forming calcareous shale containing beds of siltstone and bentonitic clay; only mapped on south flank of Uinta Mountains; 1400-1700 m thick.

Kfd FRONTIER SANDSTONE, MOWRY SHALE AND DAKOTA SANDSTONE (UPPER AND LOWER CRETACEOUS) - Shown as one unit on north slope of Jessen Butte, north flank of Uinta Mountains, because formations are too thin to show separately at map scale. See below for descriptions and thicknesses.

Kf FRONTIER SANDSTONE (UPPER CRETACEOUS) - Upper part resistant, light-brown to light-gray and yellow, fine-grained and ripple-marked sandstone with local petrified wood and invertebrate fossils; lower part soft, light- to dark-gray calcareous shale; locally includes minor limestone (with bivalve coquina) and coal beds in the lower part; 36-85 m thick.

Kmd MOWRY SHALE AND DAKOTA SANDSTONE (UPPER AND LOWER CRETACEOUS) - Locally shown as one unit along south flank of Uinta Mountains because formations are too thin to show separately at map scale. See below for descriptions and thicknesses.

Kmr MOWRY SHALE (UPPER AND LOWER CRETACEOUS) - Dark-gray, siliceous shale that weathers silver gray; contains abundant fossil fish scales and disarticulated fish bones (Anderson and Kowallis, 2005); 10-75 m thick.

Kd DAKOTA SANDSTONE (LOWER CRETACEOUS) - Upper and lower resistant, yellow and light-gray, medium- to coarse-grained sandstone beds separated by a carbonaceous shale; contains coal beds in exposures along south flank of Uinta Mountains; 15-76 m thick.

KJcm CEDAR MOUNTAIN FORMATION AND MORRISON FORMATION (LOWER CRETACEOUS AND UPPER JURASSIC) - Cedar Mountain is mapped with underlying Morrison Formation because it is generally thin and contact with underlying Morrison is difficult to map.
Cedar Mountain Formation (Lower Cretaceous) - Purple, gray, and greenish-gray mudstone, siltstone, minor sandstone and limestone; contains calcrete beds that weather out as carbonate nodules; 0-60 m thick.
Morrison Formation (Upper Jurassic) - Upper, Brushy Basin Member consists of soft, banded, variegated (light-gray, olive-gray, red, and light-purple) shale, claystone, siltstone, and minor cross-bedded sandstone, conglomerate, and bentonite; lower, Salt Wash Member consists of resistant, light-gray to white cross-bedded sandstone; Salt Wash Member may not be present in the Flaming Gorge area; dinosaur remains are preserved in Salt Wash Member at Dinosaur National Monument south of quadrangle; 90-287 m thick.

Jsc STUMP FORMATION, ENTRADA SANDSTONE, AND CARMEL FORMATION (UPPER AND MIDDLE JURASSIC) - Locally shown as one unit where formations are too thin to show separately at map scale. See below for descriptions and thicknesses.

Js STUMP FORMATION (UPPER JURASSIC) - Upper, Redwater Member is greenish-gray and light-green slope-forming shale with glauconitic, fossiliferous (belemnites and bivalves) sandstone and limestone; lower Curtis Member is resistant, light-gray to greenish-gray, cross-bedded, glauconitic sandstone; Curtis Member is thin or locally missing in this quadrangle because of erosion prior to deposition of Redwater Member along J-4 unconformity of Pipiringos and O'Sullivan (1978); palynomorph assemblage from base of Curtis Member indicates an Oxfordian age (Wilcox and Currie, 2006; Brian Currie, Miami University (Ohio), verbal communication, March 15, 2006); 40-82 m total thickness.

Je ENTRADA SANDSTONE (MIDDLE JURASSIC) - Upper part reddish-brown siltstone and fine-grained sandstone and lower part light-gray, pink, and light-brown sandstone; lower sandstone is resistant to erosion and forms cliffs and ridges; 30-75 m thick.

Jc CARMEL FORMATION (MIDDLE JURASSIC) - Medium- to dark-red, green, and gray sandy shale, sandstone, siltstone, limestone and gypsum; upper part is mostly slope-forming red shale, siltstone, and sandstone underlain by a middle gypsiferous unit; lower part is mostly ledge-forming limestone, which is commonly oolitic and fossiliferous; may contain one or more biotite-rich ash layers; 30-144 m thick.

JŦn NUGGET SANDSTONE (LOWER JURASSIC AND UPPER TRIASSIC) - Pink, light-gray, and light-brown, resistant, massive-weathering, large-scale cross-bedded sandstone; locally contains carbonate lenses (playa) and fluvial lenses (wadi) near top; forms cliffs and ridges; vertebrate tracks of Jurassic age preserved in a fluvial lens near the top of Nugget near Red Fleet Resevoir (Hamblin and others, 2000) and casts of vertebrate tracks of Late Triassic age are preserved on underside of base of Nugget south of quadrangle near Dinosaur National Monument (Lockley and others, 1992); 200-315 m thick.

Ŧcd CHINLE, MOENKOPI, AND DINWOODY FORMATIONS (UPPER AND LOWER TRIASSIC) - Shown as single map unit along Uinta fault, north of Uinta Mountains; mapped separately elsewhere; on previous maps, the Chinle beds on north flank have been called Ankareh Formation and Stanker Formation, and Moenkopi beds on north flank have been called Woodside Shale; see descriptions below for individual formations.

Ŧc CHINLE FORMATION (UPPER TRIASSIC) - Purplish-red, purple, light-gray, greenish-gray, light-green, ripple-marked siltstone, sandstone, claystone, shale, and conglomerate that locally contains abundant petrified wood; generally forms slopes; upper 26-36 m is light-reddish-brown planar laminated sandstone, cross-bedded sandstone, siltstone, and variegated mudstone that is correlated with Bell Springs Members of Nugget Sandstone by Jensen and Kowallis (2005); base is resistant conglomerate unit named the Gartra Member; 40-140 m thick.

Ŧmd MOENKOPI AND DINWOODY FORMATIONS (LOWER TRIASSIC) - Shown as single map unit east of Brush Creek drainage because Dinwoody is less than 10 m thick and possibly interbedded with basal Moenkopi Formation (see Hansen, 1977; Rowley and others, 1981).

Ŧm MOENKOPI FORMATION (LOWER TRIASSIC) - Medium- to dark-red, reddish-brown, green, and gray, ripple-marked siltstone, fine-grained sandstone, and shale with gypsum and limestone beds; mostly soft, slope-forming unit; 160-340 m thick.

Ŧd DINWOODY FORMATION (LOWER TRIASSIC) - Light-gray, greenish-gray, light-brown, and brown, thin-bedded, ripple-marked shale, siltstone, and sandstone with minor amounts of limestone; mostly soft, slope-forming unit along south flank of Uinta Mountains in Ashley and Brush Creek drainages; Dinwoody Formation thins west of Ashley Creek drainage and is represented only by gypsum beds, and is not present in and west of Dry Creek drainage; 0-160+ m thick; tectonically thickened locally.

Pp PARK CITY AND PHOSPHORIA FORMATIONS (LOWER PERMIAN) - Combined thickness 20-130 m. Includes:
Franson Member of Park City Formation - Gray, thick- to thin-bedded, cherty limestone and dolomite interbedded with brownish-gray sandstone and red to ochre shale; generally resistant and forms ledges and cliffs.
Meade Peak Phosphatic Shale Member of the Phosphoria Formation - Slope-forming, dark-gray phosphatic shale with interbeds of sandstone and limestone.
Grandeur Member of Park City Formation - Light-gray to light-brownish-gray sandstone, dolomite, and limestone; generally resistant and forms ledges and cliffs.

PIPw WEBER SANDSTONE (LOWER PERMIAN TO MIDDLE PENNSYLVANIAN) - Light-gray to yellowish-gray, very thick bedded sandstone with interbeds of limestone in the lower part; highly cross-bedded sandstone in the upper part; forms steep cliffs and ridges; 186-472 m thick.

IPMu PENNSYLVANNIAN AND MISSISSIPPIAN ROCKS, UNDIVIDED - Small fault blocks of carbonate rocks likely from Round Valley and Madison Limestones along the Uinta fault zone.

IPm MORGAN FORMATION (MIDDLE PENNSYLVANIAN) - Light- to medium-red, yellow, and gray shale and siltstone, light- to medium-gray fossiliferous and red cherty limestone, and light-red-gray, fine-grained, locally cross-bedded sandstone; 11-290 m thick.

IPrv ROUND VALLEY LIMESTONE (LOWER PENNSYLVANIAN) - Light-gray to light-blue-gray, thin- to very thick bedded limestone interbedded with soft, red shale; limestone is fossiliferous and cherty; chert is blue gray and yellowish gray, but red to pink jasperoid chert is common in the region; forms ledges and cliffs; 65-125 m thick.

Mdh DOUGHNUT SHALE AND HUMBUG FORMATION (UPPER MISSISSIPPIAN) - Combined thickness 160-181 m.
Doughnut Shale - Dark-gray shale, with some red shale near base, with beds of coarse sandstone, limestone and organic shale; shale is slope forming and clayey; 24-91 m thick.
Humbug Formation - Light-gray to red, fine-grained to very fine grained, soft to resistant sandstone interbedded with light-gray limestone and red to black shale; sandstone is locally cross-bedded and hematitic near top of formation; may contain caves and sinkholes along the south flank of the Uinta Mountains; 30-90 m thick.

Mm MADISON LIMESTONE (LOWER MISSISSIPPIAN) - Mostly dark-gray, medium to coarse crystalline, cherty limestone; chert is typically light gray; contains numerous caves and sinkholes; 130-300 m thick.

Ꞓl LODORE FORMATION (UPPER CAMBRIAN) - Light-brown to greenish-gray sandstone underlain by pink to tan to pale-greenish-gray glauconitic shale interbedded with tan to pale-green sandstone; base is variegated (pink, gray, and pale-green) coarse to medium grained, cross-bedded sandstone; locally pebbly; upper part forms ledges, middle part forms slopes and ledges, and lower part forms cliffs; Lodore pinches out to the west; 0-180 m thick.

Zur RED PINE SHALE, UINTA MOUNTAIN GROUP (MIDDLE UPPER PROTEROZOIC) - Dark-gray to dark-green-gray shale and siltstone; interbedded with brown-gray to brown-red sandstone and quartzite, thin bedded near base becoming thick bedded near the top; sandstone is medium to coarse grained, cross-bedded, and siliceous; age based on palynomorphs recovered from dark-gray shale near base of formation in Whiterocks Canyon (Nagy and Porter, 2005; Sprinkel and Waanders, 2005); only exposed in the southwest part of quadrangle; estimated at 0-600 m thick.

Zu UINTA MOUNTAIN GROUP, UNDIVIDED (MIDDLE UPPER PROTEROZOIC) - Dark- to light-red, fine- to coarse-grained, quartzose, lithic, and feldspathic sandstone and quartzite; sandstone is thick to medium bedded; planar, contorted, and cross-bedding is preserved; some beds contain tool and groove marks, ripples, and mudcracks; contains considerable red, green, and dark-gray micaceous shale interbeds and some conglomerate; map unit divided where Outlaw Trail marker bed is mapped (Connor and others, 1988; De Grey, 2005; De Grey and Dehler, 2005); age based on palynomorphs recovered from dark-gray shale (Sprinkel and Waanders, 2005); as much as 4500 m thick.

Zuo OUTLAW TRAIL MARKER BED, UINTA MOUNTAIN GROUP (MIDDLE UPPER PROTEROZOIC) - Light- to dark-olive green micaceous shale interbedded with reddish-brown, fine- to medium-grained, quartzose, feldspathic, and lithic sandstone, and siltstone; sandstone is thin to medium bedded; planar, contorted, and cross-bedding is preserved; some beds contain symmetrical and interference ripples and mudcracks; previously mapped and described in Swallow Canyon quadrangle (Connor and others, 1988; De Grey, 2005); U-Pb SHRIMP detrital zircon age of 770 Ma (Fanning and Dehler, 2005); as much as 200 m thick.

Zuju UPPER JESSE EWING CANYON FORMATION, UINTA MOUNTAIN GROUP (LOWER[?] UPPER PROTEROZOIC) - Dark-gray (on fresh surface) shale interbedded with light- to medium-red-brown quartzose and lithic sandstone; medium to thick bedded; a few conglomerate beds similar to lower conglomerate member are present but pinch out southward into shale; age based on palynomorphs recovered from dark-gray shale bed (Sprinkel and Waanders, 2005) preserved in a down-faulted block defined as basal Jesse Ewing Canyon Formation by Sanderson and Wiley (1986); 150-440 m thick.

Zujl LOWER JESSE EWING CANYON FORMATION, UINTA MOUNTAIN GROUP (LOWER[?] UPPER PROTEROZOIC) - Dark- to light-red, brown, and reddish-purple pebble to boulder conglomerate interbedded with quartzose and lithic sandstone and some shale; clasts are subrounded to subangular, white, pale green, and pink quartzite (from Red Creek Quartzite); thick to medium bedded; fining up in individual beds as well as in formation as a whole; 58-245 m thick.

YWr RED CREEK QUARTZITE (MIDDLE PROTEROZOIC TO UPPER ARCHEAN) - Contains three main rock types: metaquartzite, mica schist, and amphibolite; other minor rock types include metadiorite and metacarbonate to marble; estimated as much as 6100 m thick (Hansen, 1965).

YXra Amphibolite - Dark-gray to black, fine- to medium-grained amphibolite composed of strongly foliated to non-foliated metamorphosed mafic rocks, mostly hornblende; intruded into and intimately associated with the Red Creek Quartzite as numerous small bodies in the northeast part of the quadrangle.

XWrq Metaquartzite - Resistant white, gray, tan, and light-green metaquartzite.

XWrm Mica schist - Quartz-muscovite schist that grades between metaquartzite and mica schist and contains garnet and staurolite.

XWre Metadiorite - Metamorphosed diorite; epidiorite of previous mappers.

XWrc Carbonate rock - Metamorphosed carbonate rock along Goslin fault.

Wo OWIYUKUTS COMPLEX (UPPER ARCHEAN) - High-grade, metamorphosed potassium-rich granitic gneiss and lesser quartzofeldspathic gneiss; Rb-Sr age 2700 Ma (Graff and others, 1980; Sears and others, 1982), but Houston and others (1993, p. 155) report that the age could be as young as 1800 Ma; unknown thickness.

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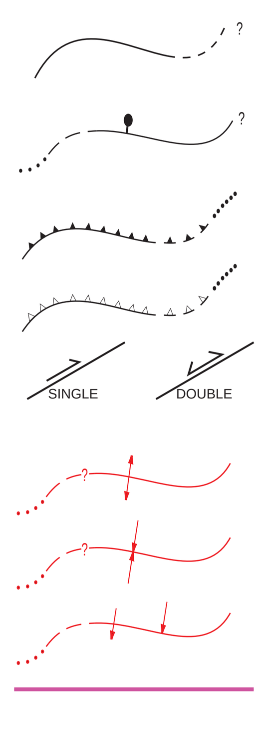
Map and Cross Section Symbols



CONTACT - Dashed and queried(?) on cross section where approximately located

FAULT

Steeply dipping - Dashed where approximately located; dotted where concealed; queried(?) where existence uncertain; bar and ball on downthrown side where offset is known

Thrust fault - Dashed where approximately located; dotted where concealed; teeth on hanging wall

Reverse - Dashed where approximately located; dotted where concealed; teeth on hanging wall

SINGLE DOUBLE Fault on cross section - Single arrow represents single direction of movement; double arrow represents two episodes of movement in opposite directions

FOLD AXIS

Anticline - Dashed where approximately located; dotted where concealed; queried(?) where existence uncertain

Syncline - Dashed where approximately located; dotted where concealed; queried(?) where existence uncertain

Monocline - Anticlinal bend on left, synclinal bend on right; dashed where approximately located; dotted where concealed

IGNEOUS DIKE - Exposed in the Deadman Lake area and in Lakeshore Basin southwest of Leidy Peak; generally exposed where Qgs is thin; called gabbroic dike by Rowley and others (1985) and biotitic diorite by Ritzma (1983); isotopic age (K-Ar) from ferromagnesian and plagioclase mineral concentrate is 493±17 Ma (Ritzma, 1983)

BEDDING FORM LINE - General bedding geometry in Uinta Mountain Group (Zu) on cross section B-B'

MARKER BED - Labeled on cross section A-A'

STRIKE AND DIP OF BEDDING

25 Inclined; 65 Overturned; Horizontal; Vertical

OTHER SYMBOLS

Well used in cross sections (see plate 3 for data)

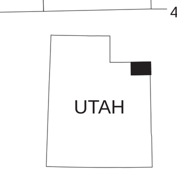
Sample location for palynology and radiometric ages (see plate 3 for palynolgy data)

Sources of Geologic Mapping and Index to U.S. Geological Survey 7.5-minute Quadrangles in the Dutch John 30' x 60' Quadrangle

110° — 109° — 41° — 40° 30'

Phil Pico Mtn.: Anderman (1955); Bradley (1988); Munroe (2001); Sprinkel (2002)	Jessen Butte: Anderman (1955); Sprinkel and Jensen (2004)	Manila: Anderman (1955); Hansen and Bonilla (1956); Hansen (1965)	Flaming Gorge: Anderman (1955); Hansen (1962, 1965)	Dutch John: Hansen (1961b, 1965)	Goslin Mtn.: Hansen (1961b, 1965); Counts (2005)	Clay Basin: Hansen (1957, 1965); Sprinkel (2005); Counts (2005)	Willow Creek Butte: Hansen (1961a, 1965); Sprinkel (2005)
Whiterocks Lake: Munroe (2001); Sprinkel (2002)	Leidy Peak: Munroe (2001); Sprinkel (2002)	Elk Park: Sprinkel (2002)	East Park Reservoir: Sprinkel (2002)	Mount Lena: Sprinkel (2002)	Jackson Draw: Sprinkel (2002); Counts (2005)	Warren Draw: Hansen (1965); Sprinkel (2002); Counts (2005)	Swallow Canyon: Hansen (1965); Sprinkel (2002); De Grey (2005)
Paradise Park: Munroe (2001); Sprinkel (2002)	Marsh Peak: Munroe (2001); Sprinkel (2002)	Taylor Mtn.: Kinney (1955); Munroe (2001); Sprinkel (2001)	Dyer Mountain: Kinney (1955); Sprinkel (2001)	Burnt Cabin Gorge: Kinney (1955); Sprinkel (2001)	Blair Basin: Kinney (1955); Sprinkel (2001)	Crouse Reservoir: Hansen and others (1981); Sprinkel (2005)	Hoy Mountain: Hansen and Rowley (1991); Sprinkel (2005)
Ice Cave Peak: Kinney (1955); Sprinkel (2001)	Lake Mountain: Kinney (1955); Sprinkel (2001); Kowallis (2005)	Dry Fork: Kinney (1955); Sprinkel (2001); Haddox (2005)	Steinaker Reservoir: Kinney (1955); Sprinkel (2001); Haddox (2005)	Donkey Flat: Kinney (1955); Sprinkel (2001); Jensen (2005)	Jensen Ridge: Kinney (1955); Sprinkel (2001)	Island Park: Rowley and others (1981); Sprinkel (2005)	Jones Hole: Hansen (1977); Sprinkel (2005)

Additional references include Schell (1969), Schell and Dyni (1973), and Graff and others (1980).



ACKNOWLEDGMENTS

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Interim Geologic Map of the Dutch John 30' x 60' Quadrangle, Daggett and Uintah Counties Utah, Moffat County, Colorado, and Sweetwater County, Wyoming

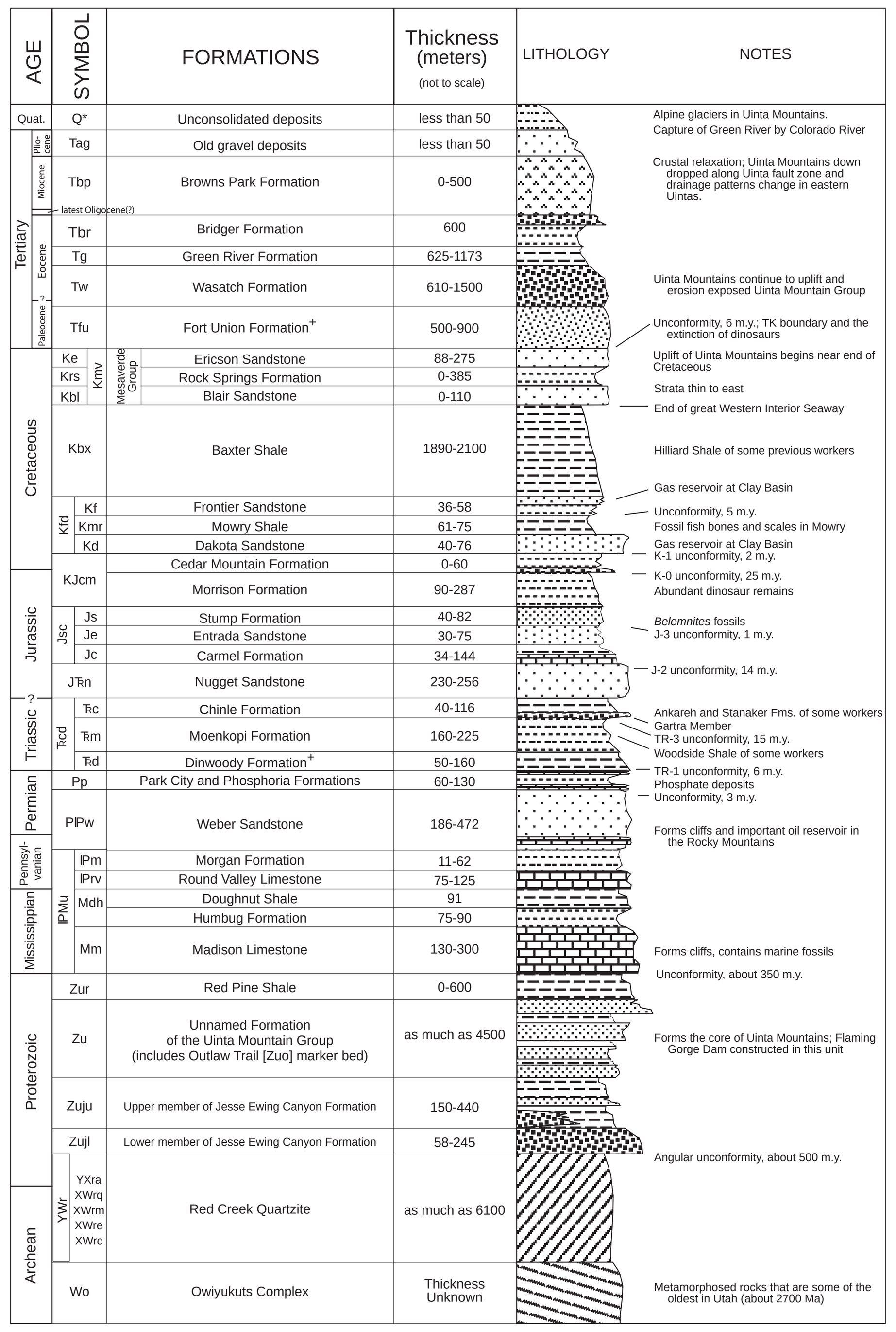
Douglas A. Sprinkel

2006

10/05/2006

Utah Geological Survey
a division of
Utah Department of Natural Resources

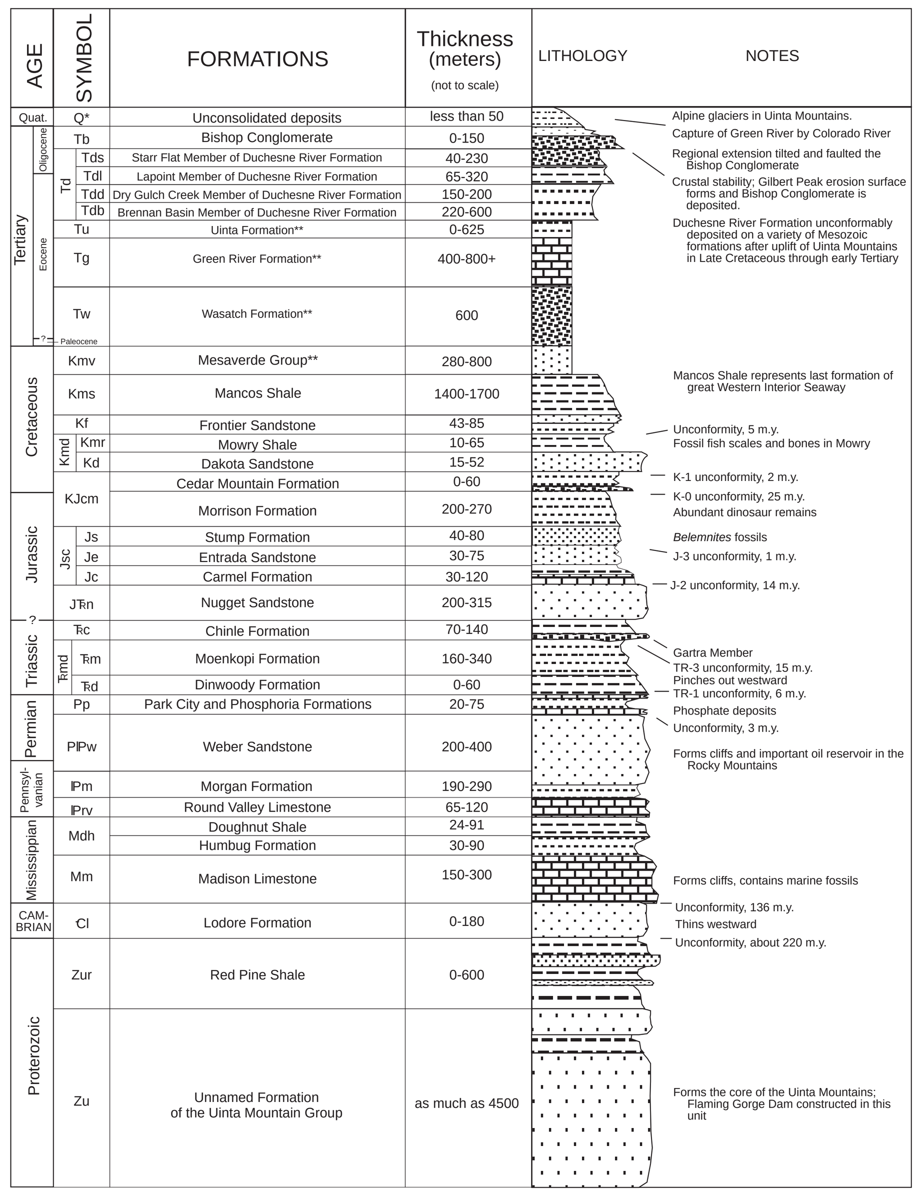
Stratigraphic Column for North Flank of the Uinta Mountains



*See Correlation of Quaternary Units for symbols
+Unit may be tectonically thickened

Not to scale

Stratigraphic Column for the South Flank of the Uinta Mountains



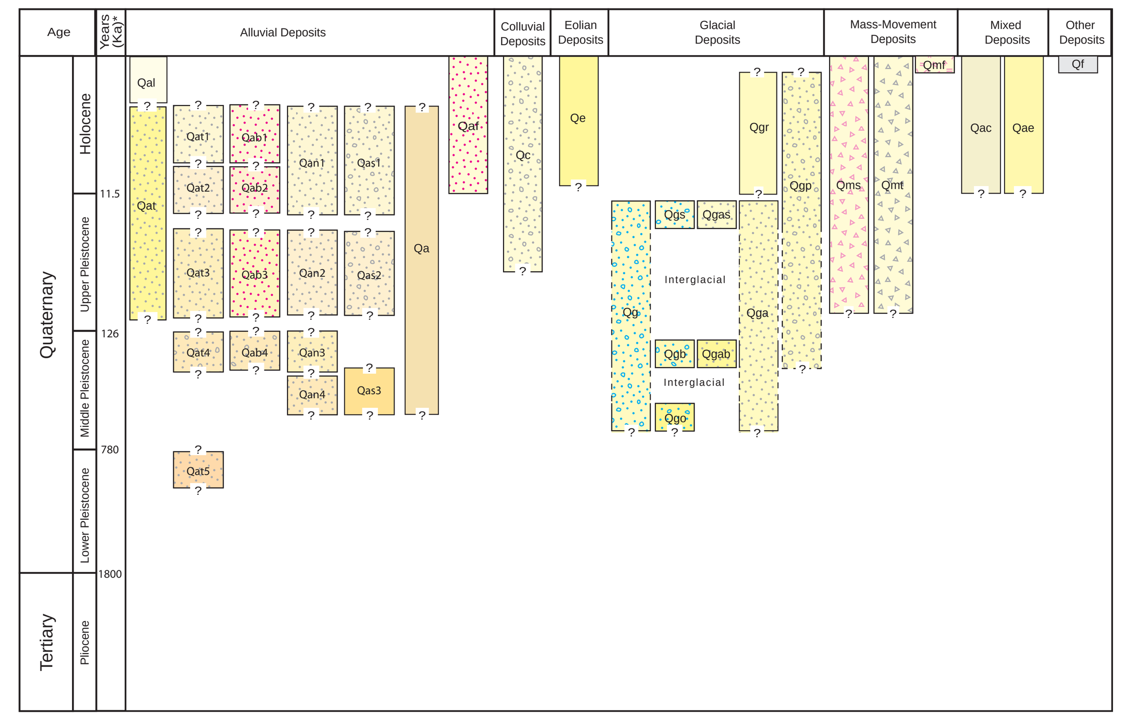
*See Correlation of Quaternary Units for symbols
**not exposed in quadrangle - on cross section only

Not to scale

Wells Used in Cross Section (tops picked by D.A. Sprinkel)

ID	Cross Section	Well Information	Formation	Top (m)	Thick (m)	Top (ft)	Thick (ft)
1	A - A'	Preston Oil Company	Bridger Formation	0	191	0	627
		Antelope Hollow Unit 44-17	Green River Formation	191	626	627	2053
		SE1/4SE1/4 section 17, T. 3 N., R. 19 E.	Wasatch Formation	817	616	2680	2021
		Daggett County, Utah	Total Depth	1433		4701	
		API: 4300930064					
2	A - A'	Noble Energy Company	Bridger Formation	0	30	0	100
		Antelope Hollow State 32-20	Green River Formation	30	1173	100	3850
		SW1/4NE1/4 section 20, T. 3 N., R. 19 E.	Wasatch Formation	1204	1469	3950	4820
		Daggett County, Utah	Fort Union Formation	2673	755	8770	2477
		API: 4300930065	Mesaverde Group	3428	696	11247	2285
			Ericson Sandstone	3428	252	11247	826
			Rock Springs Formation	3680	381	12073	1250
			Blair Sandstone	4061	64	13323	209
			Baxter Shale	4125	196	13532	643
			Total Depth	4321		14175	
3	A - A'	Carter Oil Company	Duchesne River Formation	0	305	0	1000
		Whiterocks Unit 2	Uinta Formation	305	213	1000	700
		SW1/4NE1/4 section 6, T. 1 N., R. 1 E.	Green River Formation	518	811	1700	2660
		Uintah County, Utah	Wasatch Formation	1329	494	4360	1620
		API: 4304710586	Mesaverde Group	1823	284	5980	932
			Mancos Shale	2107	103	6912	338
			Total Depth	2210		7250	
4	B - B'	E.L.K. Oil Company	Baxter Shale	0	488	0	1600
		SW1/4NE1/4 section 20, T. 3 N., R. 20 E.	Frontier Sandstone	488	58	1600	190
		Daggett County, Utah	Mowry Shale	546	49	1790	160
		API: 4300910339	Total Depth	594		1950	
5	C - C'	McMoran-Freeport Oil Company	Uinta Mountain Group	0	797	0	8721
		State 43-2A	upper Jesse Ewing Canyon Formation	117	438	385	1438
		NE1/4SE1/4 section 2, T. 2 N., R. 25 E.	lower Jesse Ewing Canyon Formation	556	241	1823	791
		Daggett County, Utah	Red Creek Quartzite	797	386	2614	1268
		API: 4300930058	Owiyukuts Complex(?)	1183	1475	3882	4839
			Uinta fault	2658	0	8721	0
			Baxter Shale	2658	764	8721	2506
			Frontier Sandstone	3422	42	11227	138
			Mowry Shale	3464	73	11365	239
			Dakota Sandstone	3537	61	11604	200
			Cedar Mountain Formation	3598	27	11804	87
			Morrison Formation	3624	91	11891	297
			Stump Formation	3715	82	12188	270
			Entrada Sandstone	3797	49	12458	162
			Carmel Formation	3847	34	12620	112
			Nugget Sandstone	3881	236	12732	774
			Chinle Formation	4117	41	13506	134
			Moenkopi Formation	4157	207	13640	680
			Dinwoody Formation	4365	49	14320	160
			Park City Formation	4414	64	14480	210
			Weber Sandstone	4478	186	14690	610
			Morgan Formation	4663	62	15300	205
			Round Valley Limestone	4726	75	15505	245
			Doughnut-Humbug Formation	4801	173	15750	568
			Madison Limestone	4974	121	16318	397
			Total Depth	5095		16715	
6	C - C'	Dreilling & Sons Inc	Frontier Sandstone	0	162	0	530
		Hiko Bell Federal 1	Mowry Shale	162	24	530	80
		NW1/4NW1/4 section 21, T. 3 S., R. 24 E.	Dakota Sandstone	186	52	610	170
		Uintah County, Utah	Cedar Mountain Formation	238	30	780	100
		API: 4304730036	Morrison Formation	268	195	880	640
			Stump Formation	463	52	1520	170
			Entrada Sandstone	515	48	1690	159
			Carmel Formation	564	37	1849	121
			Nugget Sandstone	600	238	1970	780
			Chinle Formation	838	87	2750	286
			Moenkopi Formation	925	166	3036	544
			Dinwoody Formation	1091	59	3580	193
			Park City Formation	1150	36	3773	117
			Weber Sandstone	1186	78	3890	257
			Total Depth	1264		4147	
7	C - C'	Hiko Bell Mining & Oil Company	Mancos Shale	0	658	0	2160
		Jensen Ridge Federal 1	FrontierSandstone	658	72	2160	235
		SW1/4NW1/4 section 28, T. 3 S., R. 23 E.	Mowry Shale	730	24	2395	80
		Uintah County, Utah	Dakota Sandstone	754	50	2475	165
		API: 4304730042	Cedar Mountain Formation	805	30	2640	100
			Morrison Formation	835	207	2740	680
			Stump Formation	1042	40	3420	130
			Entrada Sandstone	1082	76	3550	250
			Carmel Formation	1158	43	3800	140
			Nugget Sandstone	1201	238	3940	782
			Chinle Formation	1439	89	4722	293
			Moenkopi Formation	1529	163	5015	535
			Dinwoody Formation	1692	59	5550	192
			Park City Formation	1750	48	5742	156
			Weber Sandstone	1798	94	5898	310
			Total Depth	1892		6208	

Correlation of Surficial Units



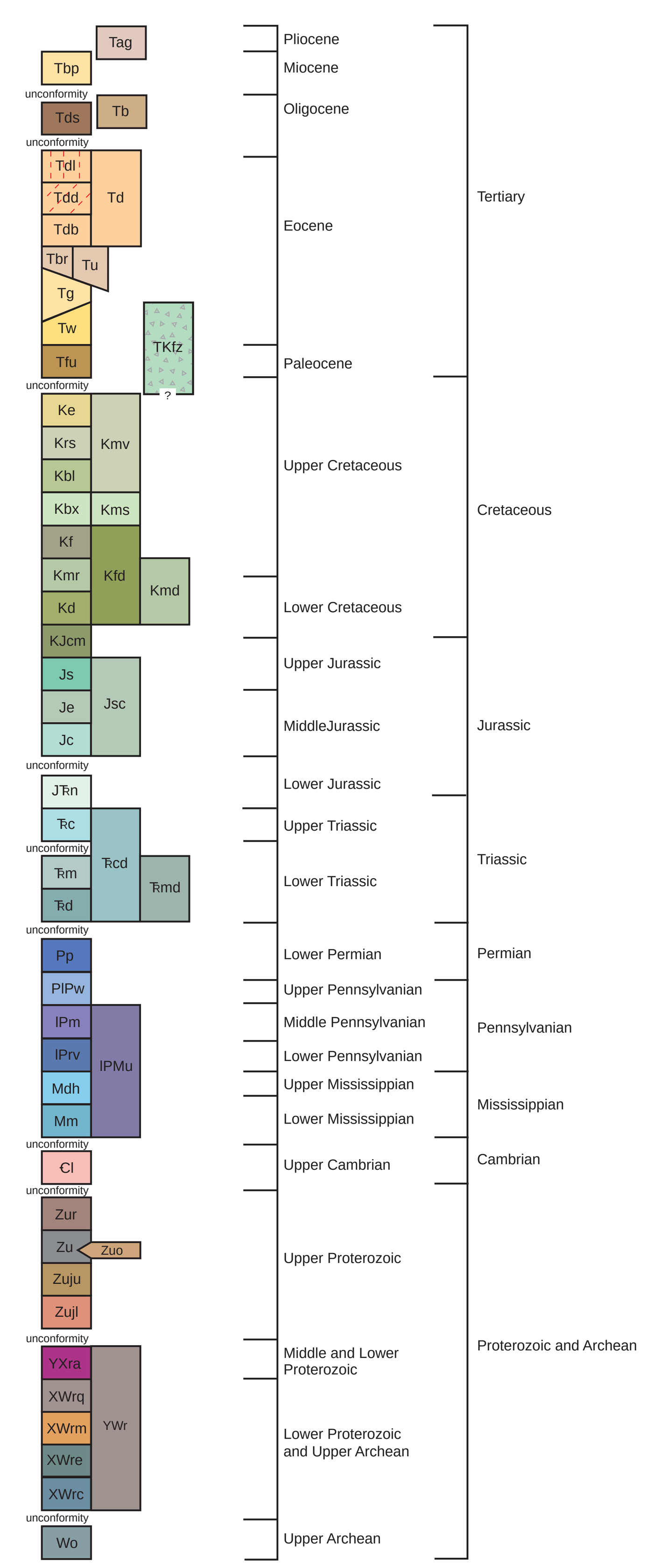
*Gradstein, F.M., Ogg, J.G., and Smith, A.G., Agterberg, F.P., Bleeker, W., Cooper, R.A., Davydov, V., Gibbard, P., Hinnov, L.A., House, M.R., Lourens, L., Luterbacher, H.P., McArthur, J., Melchin, M.J., Robb, L.J., Shergold, J., Villeneuve, M., Wardlaw, B.R., Ali, J., Brinkhuis, H., Hilgen, F.J., Hooker, J., Howarth, R.J., Knoll, A.H., Laskar, J., Monechi, S., Plumb, K.A., Powell, J., Raffi, I., Röhl, U., Sadler, P., Sanfilippo, A., Schmitz, B., Shackleton, N.J., Shields, G.A., Strauss, H., Van Dam, J., van Kolfschoten, T., Veizer, J., and Wilson, D., 2004, A Geologic Time Scale 2004: Cambridge University Press, 589 p.

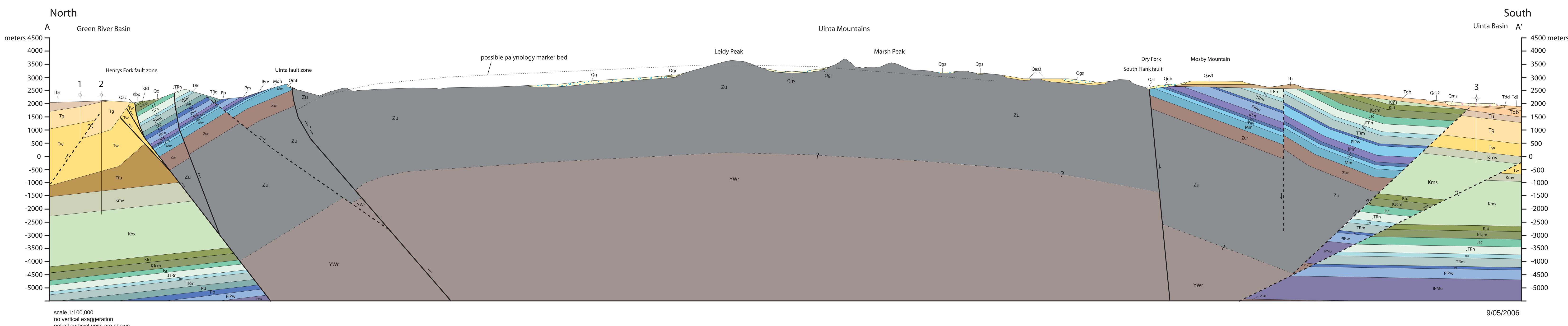
Uinta Mountain Group Palynology

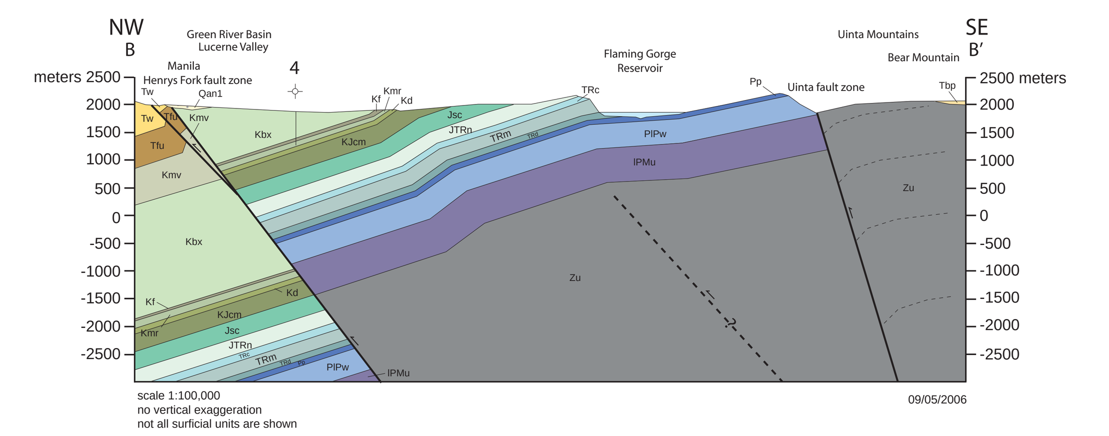
Sample Number	Formation	Microfossils*	North Latitude	West Longitude	Thermal Alteration Index (T.A.I.)
WR-100101-5	Red Pine Shale	*Leiosphaeridia* spp., ?*Eohyella, Myxococcoides* sp., ?algal filament fragments	40.62853	109.94825	2.5-2.8
WR-100101-3	Red Pine Shale	*Leiosphaeridia* spp., ?*Eohyella*, *Myxococcoides* sp., ?algal filament fragments	40.62322	109.94439	2.5-2.8
WR-100101-2	Red Pine Shale	*Leiosphaeridia* spp., ?algal filament fragments	40.62322	109.94439	2.5-2.8
BC-050404-5	Red Pine Shale	*Trachysphaeridium laminaritum, Leiosphaeridia* spp., ?algal filament fragments	40.91733	109.99855	2.5-2.8
OB-050404-6	Red Pine Shale	*Trachysphaeridium laminaritum, Leiosphaeridia* spp., ?algal filament fragments	40.91009	109.99823	2.5-2.8
BP-050404-4	Red Pine Shale	*Eosaccharomyces* sp., *Leiosphaeridia* spp., algal filament fragments	40.89376	109.92329	2.5-2.8
LO-050404-3	Uinta Mountain Group, undivided	*Leiosphaeridia* spp.	40.90246	109.87994	2.5-2.8
PA-050504-3	Uinta Mountain Group, undivided	*Trachysphaeridium laminaritum, Leiosphaeridia* spp., ?algal filament fragments	40.89531	109.78368	2.5-2.8
LP-100301-6	Uinta Mountain Group, undivided	*Leiosphaeridia* spp., ?algal filament fragments	40.76539	109.82111	2.5-2.8
LP-100301-4	Uinta Mountain Group, undivided	*Eosaccharomyces* sp., *Leiosphaeridia* spp., ?algal filament fragments	40.75989	109.87170	2.5-2.8
LP-100301-2	Uinta Mountain Group, undivided	*Eosaccharomyces* sp., *Satka* sp., *Trachysphaeridium laminaritum, Leiosphaeridia* spp., ?algal filament fragments	40.76408	109.86678	2.5-2.8
LP-100301-1	Uinta Mountain Group, undivided	*Leiosphaeridia* spp., algal filament fragments	40.76414	109.86611	2.5-2.8
USFS WW1	Uinta Mountain Group, undivided	*Trachysphaeridium laminaritum,Leiosphaeridia* spp., ?algal filament fragments	40.80900	109.46800	2.5-2.8
USFS Red Springs	Uinta Mountain Group, undivided	*Trachysphaeridium laminaritum, Leiosphaeridia* spp. ?algal filament fragments	40.80910	109.46805	2.5-2.8
DJ-050504-1	Uinta Mountain Group, undivided	*Eosaccharomyces* sp., *Trachysphaeridium laminaritum, Leiosphaeridia* spp., ?algal filament fragments	40.94209	109.41665	2.5-2.8
JE-073101-1	Jesse Ewing Canyon Formation	*Leiosphaeridia* spp., carbonaceous filaments	40.92556	109.13803	2.8

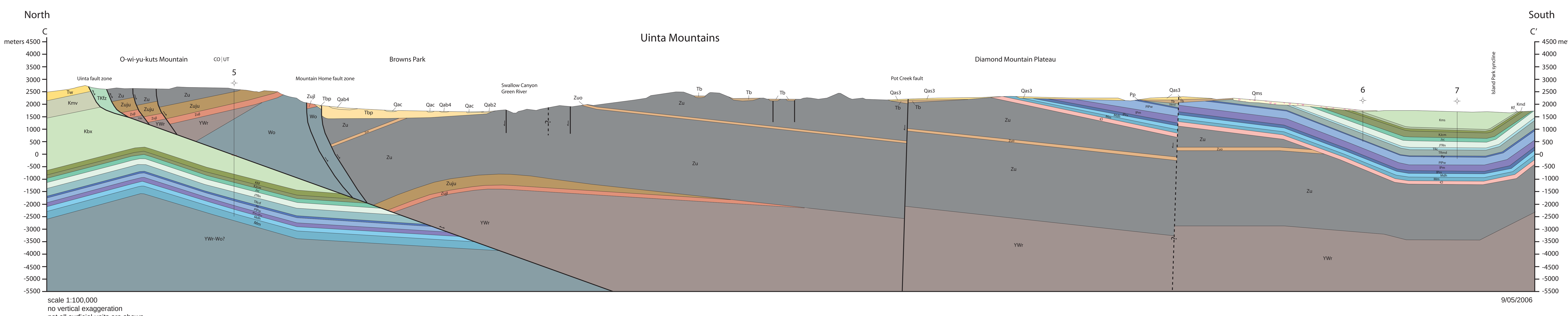
*Sprinkel, D.A., and Waanders, Gerald, 2005, Stratigraphy, organic microfossils, thermal maturation of the Neoproterozoic Uinta Mountain Group in the eastern Uinta Mountains northeastern Utah, *in* Dehler, C.M., Sprinkel, D.A., Pederson, J.L., and Kowallis, B.J., editors, Uinta Mountain geology: Utah Geological Assocation Publication 33, p. 63-73.

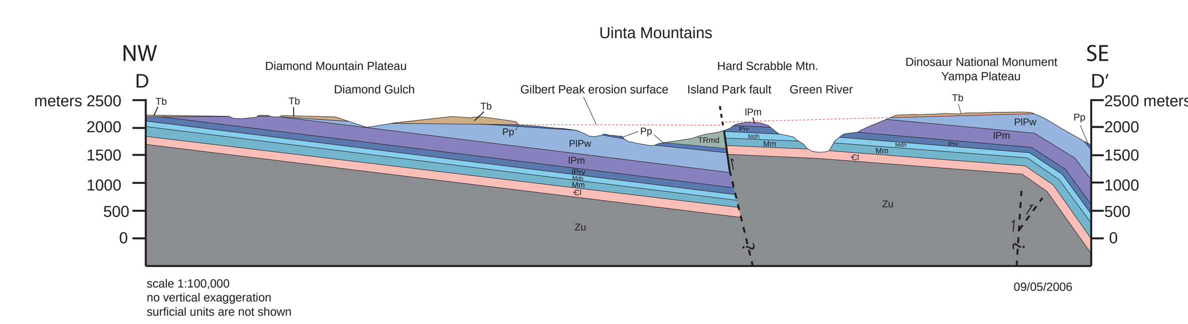
Correlation of Bedrock Units











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Interim Geologic Map of the Dutch John 30' x 60' Quadrangle, Daggett and Uintah Counties Utah, Moffat County, Colorado, and Sweetwater County, Wyoming

Douglas A. Sprinkel

2006

10/05/2006